

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln No: 10/594,157
Applicant: Ian Alastair KIRK
Filed: February 26, 2006
For : Downhole apparatus for mobilising drill cuttings
Art Unit: 3676
Examiner: FULLER, Robert E.
Attorney Docket: ZQ120/07001

Commissioner of Patents and Trademarks
PO Box 1450
Alexandria VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

S I R:

I, Paul Gwyn Williams, of Aberdeen, United Kingdom, hereby declare and state as follows:

- 1) I am a qualified drilling engineer. My qualifications and experience are set out in my previous declaration filed in connection with this application on February 2, 2011. My qualifications and experience have not changed since then except that my current position is now drilling engineer for the

International oil and gas company TAQA Bratani Ltd My duties at TAQA Bratani Ltd are to plan, supervise and conduct the drilling of oil and gas wells, including directional drilling.

- 2) I have read and understood the response filed February 3, 2011, and the final Office Action dated March 9, 2011, as well as the earlier papers issued on the present application, referred to in my previous declaration, including the cited documents of DeBray (US 6,032,748) and Buttolph (US 2,589,534).
- 3) I note that in the Final office action dated March 9, 2011, the examiner has continued to reject the claims of the present application on the basis that the claims are obvious over Buttolph and DeBray, and has indicated in the "Response to arguments" section beginning at page 7 of the office action that the arguments in the declaration are not persuasive because:
 - "the arguments [in the declaration] refer to figs 1 and 2 embodiments of Buttolph, where the sleeve assembly is used to direct the path of the drill bit. However the Fig 3 embodiment simply uses the sleeve assembly to keep the drill string on a vertical path (column 4, lines 3-15). The Fig 3 embodiment of Buttolph and the device of DeBray perform the same function, that is, stabilising and centralizing a drill string."...
 - "... DeBray's device is therefore designed to withstand all of the same forces that Buttolph's device would experience"... ; and

- "...DeBray provides the added benefit of being able to attach the device at any point on the drill string without being confined to threaded areas. Therefore, modifying Buttolph to be clamped would not negatively impact its ability to perform its primary function, which is to centralize a drill string..."

- 4) I agree that the Fig 3 embodiment of Buttolph keeps the drill collar central and vertical in the bore. This is clearly stated at column 2 lines 51-57. Note however, that Buttolph's devices are only attached to the heavy weight drill collar A and not to the drill string D as indicated in my previous declaration. The drill collar and the drill string are different components as acknowledged by Buttolph. The drill string generally has a much lighter weight than the drill collar, which is a very heavy, large diameter length of pipe attached below the drill string, and is used to apply weight to the drill bit just below it.
- 5) I disagree with the underlined conclusions of the examiner set out in paragraph 3 above. In particular, it is not correct to extrapolate from any part of Buttolph that keeping the drill collar A vertical is the ONLY function of the Fig 3 embodiment, although it does appear that centralising the string is the only function of the DeBray device. The Fig 3 embodiment uses the same drill guide 10 (all labelled B in Figs 1-3) as the Fig 1 and 2 embodiments, and the only difference between Figs 1, 2 and 3 is in the angle of the drill collar A, and the location of the drill guide B rather than in any structural difference in the drill guide B itself. Indeed the passage introducing Fig 3 at column 4 lines 3-15 refers to Fig 4 as the enlarged detailed illustration of the Fig 3 embodiment,

which describes the same specific drill guide 10 that is shown in Figs 1 and 2. The guide B (or 10) referred to in Figs 1, 2 AND 3 of Buttolph is therefore the SAME ITEM. This same drill guide 10 still needs to withstand the exceptionally large axial forces applied to the drill guide during jarring operations whether it is in a vertical well as shown in Fig 3 or a deviated well as shown in Figs 1 and 2. Note that the reference to jarring in Buttolph in column 7 lines 15-29 does not refer exclusively to Figs 1 and 2, but actually uses reference numbers that are common to all of Figs 1-4, including Fig 3.

- 6) Jarring can be necessary in vertical wells or in deviated wells. In fact, if the drill guide B becomes stuck in the hole and needs to be jarred to release it, then the axial component of the force applied to the drill guide B is actually far greater in a vertical well as shown in Fig 3 than it is in a deviated well as shown in Figs 1 and 2. In deviated wells (i.e. non-vertical wells), the string components drag along the lower surface of the wellbore, and even when low friction centralisers are used, this generates frictional forces that tend to retard the axial movement of the string. These frictional forces are different in a vertical hole, where the string components are spaced radially from the wall of the borehole, and so the frictional forces retarding the string in a vertical hole are very much lower than in deviated holes. This means that the string can more easily gain axial momentum during jarring in a vertical well, and so jarring forces are typically higher in vertical wells.
- 7) Therefore, as well as centralizing the drill collar A the Fig 3 guide ALSO requires the same resistance to axial forces encountered during jarring as

were described in my earlier declaration. If anything, I would expect the Fig 3 vertical embodiment might require even more resistance to axial jarring forces than the other deviated well embodiments because of the lower frictional resistance to axial movement in vertical wells, as explained in the preceding paragraph.

- 8) Accordingly the examiner's conclusion that "DeBray's device is therefore designed to withstand all of the same forces that Buttolph's device would experience" is also incorrect. While both the Buttolph and DeBray devices are designed to centralise, only Buttolph's drill guide 10 is designed to withstand axial jarring forces. In fact, Buttolph says in column 7 line 23, with reference to the same drill guide 10 that this jarring ability is

- *"an important feature of the construction since a structure effective as a guide and of such size as to substantially fit the well bore may, in some cases, have a tendency to become slightly stuck or lodged, requiring a slight jarring action in order to work it loose"*

- 9) Hence, the feature of the jarring resistance is not something trivial for Buttolph that would be overlooked by a skilled person seeking to modify Buttolph's design, but instead it is an extremely important function which Buttolph itself emphasises as being important.

- 10) Therefore, the examiner's conclusion that "*modifying Buttolph to be clamped would not negatively impact its ability to perform its primary function*" ignores

the fact that modifying Buttolph to introduce a clamp as described by DeBray would undoubtedly negatively impact its other function of facilitating axial jarring of the drill guide when it gets stuck. This is an important function of Buttolph, and I believe that a skilled person who was tempted to consider modifying any embodiment of Buttolph to be clamped rather than attached to the drill collar exactly as Buttolph teaches would understand that any such clamping modification would render the device unsuitable for jarring. I have no doubt that any moderately skilled person would therefore reject such a modification because it would necessarily compromise a feature (the ability to withstand jarring) which Buttolph teaches is important.

- 11) In particular, jarring operations carried out to free a stuck drill guide that is carried on the drill collar A (on which all of Buttolph's embodiments are mounted) would involve much higher momentum than the equivalent operation carried out on a drill string, as a result of the higher weight of the drill collar A, so resistance to axial jarring forces is even more important for components that are carried on the drill collar (like Buttolph) rather than on the drill string (like DeBray).
- 12) The examiner has also commented that the comparison in my earlier declaration between the clamp of DeBray and the "integrated sleeve" of Buttolph is flawed. I have considered this and believe that the comparison set out in my earlier declaration is valid, because the screw threads in the Buttolph device cut radially into the metal of the Buttolph sub to provide a true resistance to axial movement or stripping. In contrast, the DeBray device

deliberately avoids this and instead the whole point of DeBray is to avoid the possibility of any kind of hard metal being pressed radially into the pipe by surrounding the pipe with the soft malleable bushings 16, 18 (see the passage bridging columns 3 and 4). Therefore, DeBray is completely different from Buttolph. DeBray is also designed only for use with the drill string, and does not mention the drill collar, which is the only place that Buttolph attaches his guides. As discussed above, and in my earlier declaration, the relatively light drill string is a very different component to the much heavier drill collar, and components designed for the drill collar generally need to be more robust than components designed for the drill string. Part of the reason for this is that the movement of the heavy weight drill collar involves more momentum than the relatively lighter drill string.

- 13) While the threaded proposal of Buttolph applied to the drill collar A would eventually fail under very high axial loads (everything eventually fails under enough load) I have no doubt that the threaded connection could withstand higher axial jarring forces than the clamped-on proposal of DeBray, and there is also no doubt in my mind that modifying the Buttolph design to be clamped rather than screwed to the drill collar would reduce the axial load threshold at which the modified device would fail to an unacceptably low level for the reasons previously presented.
- 14) I do not consider it a feasible option to modify any embodiment of Buttolph to be clamped onto the drill collar rather than screwed on as is actually disclosed by Buttolph, and I believe that any other skilled person would share my

aversion to doing so, because any such modification would lack sufficient resistance to axial forces applied during jarring.

15) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that wilful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the above-mentioned application or any patent issued thereon.

Date: 02/06/11 Signed: Paul Gwyn Williams
Paul Gwyn Williams

Witnessed by Derek J Harrow (Witness signature)

DEREK J HARROW (Print witness name)